ENHANCING PATIENT CARE THROUGH MEDICAL IMAGING

Canadian Association of Radiologists
L'Association canadienne des radiologistes

EXECUTIVE SUMMARY

The Canadian Association of Radiologists (CAR) is the national voice for radiologists in Canada, representing 2,500 members who provide vital medical imaging for millions of patients across the country. The CAR is dedicated to maintaining the highest standards of care, promoting patient safety and helping radiologists contribute to the very best care for patients.

Medical imaging procedures are essential for the health of Canadians. Wait times for diagnostic imaging continues to be a challenge for Canadians due to the under supply of necessary diagnostic imaging equipment. A medical imaging inventory study conducted by the OECD demonstrates that Canada is behind the OECD average coming in behind Poland. It is projected by 2036 that 25% of Canadians will be 65 years or older.[1] With an increasing aging population, demand for medical imaging procedures will continue to increase faster than overall population growth. To meet the current and projected demand, a greater investment needs to be made in medical imaging equipment as well as health human resources. Innovations such as the application of Artificial Intelligence (AI) in imaging will help extend the capacity of radiologists, however, it will not eliminate the need for these procedures.

A federal investment in medical imaging technology will yield a stronger, more sustainable and efficient healthcare system. The CAR is seeking the federal government's support in establishing a national medical imaging equipment fund that would ensure Canadians have equitable access to life saving diagnostic tests and procedures. Furthermore, the CAR would like to work with the federal government to establish regulations for new technologies such as AI, that will help extend the reach of radiologists and recognize Canada as a national leader in technology.

RECOMMENDATIONS

The CAR is asking the federal government to support the following recommendations:

1. $1.1 billion over the next five years, as part of the federal transfer to the provinces, to ensure imaging equipment meets the quality standards that patients deserve, inclusive of our seniors and indigenous communities.
2. $9 million over three years to fund projects to implement clinical decision support tools for imaging referrals.
3. $10.5 million over three years to establish federal frameworks to regulate the implementation of AI tools in radiology and healthcare.
4. Revise the Canadian Task Force on Preventive Care Breast Imaging Guidelines, lowering the breast imaging screening age to 40 years of age.

HEALTHCARE IN CANADA

Healthcare represents nearly 11% of GDP: however, Canada lags behind other OECD countries in health system performance across the domains of quality, access, efficiency, equity and expenditures. In 2017, the Commonwealth Fund ranked Canada 9th out of 11 nations.[2] Canada needs to invest in aspects of the healthcare system that will produce measurable outcomes. It is imperative to ensure equitable access across the country to healthcare and harness new and innovative technologies to efficiently address quality and health system sustainability.

RADIOLOGY CAN HELP

Imaging is vital to the diagnosis and treatment of diseases. In 2017, the Conference Board of Canada found that radiology adds value to the healthcare system by reducing downstream treatment costs for progressive disease, by harnessing innovative technologies to improve access to care, and by contributing to initiatives geared at improving the appropriateness of imaging referrals.[3] A poll conducted by Nanos Research highlighted that nearly all Canadians believe that the work that radiologists do is valuable to the healthcare system.[4]

Technological advancements such as AI in radiology can also help underserved communities including our seniors, who otherwise would not have access to medical imaging and put Canada on the forefront of advanced medical research.

INVEST IN INNOVATION

In 2015, the Advisory Panel on Healthcare Innovation advocated for programs and funding, spearheaded by the federal government, to generate health system improvement. Subsequently, the Mandate Letter for the Minister of Health called for "pan-Canadian collaboration on health innovation to encourage the adoption of new digital health technology to improve access, increase efficiency and improve outcomes for patients."[5] The recommendations outlined below will advance innovation in healthcare, improve the quality of lives for Canadians and will contribute to the overall growth of the economy.

1. CLOSE THE GAP ON MEDICAL IMAGING EQUIPMENT

Improving access to quality equipment is one of the best ways to ensure efficient imaging services for patients. The median number of weeks patients must wait for access to a computed tomography (CT) or magnetic resonance imaging (MRI) scanner, or an electroencephalogram (EEG) has increased, and there are considerable variations in wait times between provinces.[6] Moreover, Canada is rated in the bottom half of the countries with data collected by the OECD in terms of number of CT and MRI units per million people.[7] This figure is exacerbated by unequal distribution of units across the country, and by aging units that are no longer as safe and effective as they need to be for optimal patient care.[8] It has been estimated that 27% of medical imaging equipment is more than 10 years old. This is significantly below the Golden Rule measure, developed by COCIR (European Coordination Committee of the Radiological, Electromedical and Healthcare IT Industry). In 2003 this measure was used as the standard for optimal medical equipment distribution and is referenced by the Conference Board in the Value of Radiology Part II report to guide the optimal diagnostic imaging investment, recommending that 60% of medical imaging equipment should be less than 5 years old.[9]

Further, a Nanos poll revealed that seven in ten Canadians say that Canada should spend tax dollars to have more current medical imaging equipment.

We need to ensure that patients and providers have access to more efficient technologies that can better diagnose illness and treat disease. This not only benefits patients in ensuring better access to technology but also improves health outcomes through early detection of illness and disease for underserved populations such as our seniors and indigenous community, all while saving the government a significant amount of money. The Conference Board estimated that if the federal government were to invest $4.4 billion dollars in medical imaging equipment over 20 years, we could save the economy up to $**3.5 billion per year** in revenues that would otherwise be lost in productivity.[10] Many patients who are waiting for medical imaging procedures are not able to work due to illness or injury. This affects the economy as these patients are not generating revenue and are not contributing financially. The Conference Board identified $430 million in lost tax revenue per a year as a direct result of patients who are waiting for medical imaging procedures.[11] By providing proper access to medical imaging tests through more inventory, patients

Despite the demonstrated need and strain on the system, radiology has not received targeted investment from the federal government to address the equipment gap in over a decade.

can be diagnosed and treated sooner resulting in less time off work and substantial cost savings to the economy.

In 2004, the government invested $2.5 billion over five years in the Diagnostic and Medical Equipment Fund, which was dispersed to provinces on a per capita basis to support the purchase of equipment. These investments can and should be made again.

Recommendation: Invest $1.1 billion, over five years, as part of the federal transfer to the provinces, to ensure that available imaging equipment meets the quality standards that patients deserve.

2. ENSURE THE APPROPRIATENESS OF IMAGING REFERRALS

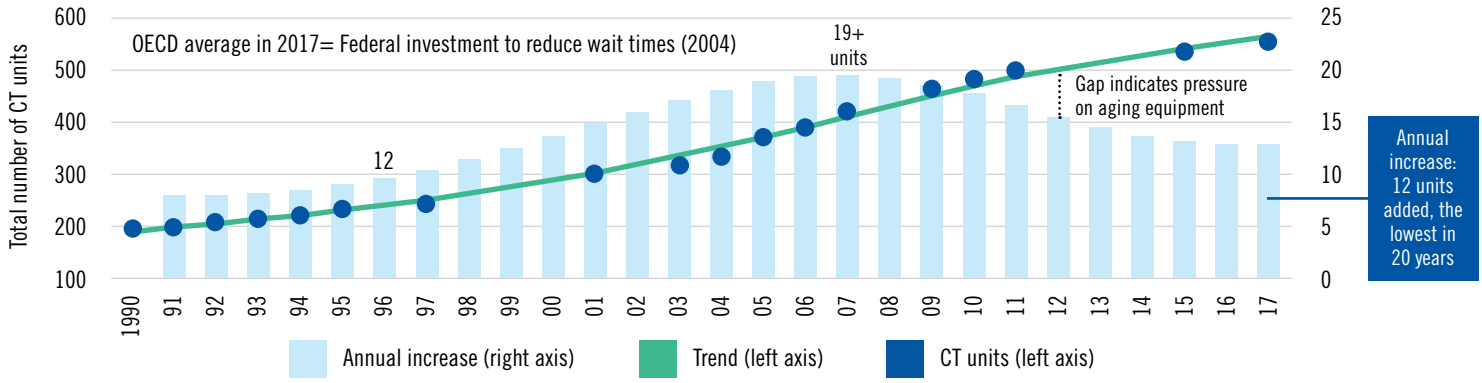
Clinical decision support (CDS) for diagnostic imaging is a data-driven tool being explored by innovative firms in Canada.[12] CDS systems are software systems that integrate into existing clinical workflows, and will help front line physicians make optimal decisions about which diagnostic test to request, ensuring that imaging resources are allocated efficiently.[13] The ultimate goal of this tool is to help physicians and patients make more informed decisions regarding medical imaging tests and treatments. Targeted investment into CDS would operationalize millions of dollars of investment already made by Canada Health Infoway, Choosing Wisely and provincial health authorities and improve efficiency and appropriateness for referrals thus reducing unnecessary wait times and helping to alleviate physician burnout.

The CAR has championed an initiative to bring impacted stakeholders together to weigh in on the most appropriate infrastructure to support appropriate referrals for medical imaging. Support is required from the federal government to capitalize on the investments that have already been made into EMR/EHR platforms, Choosing Wisely Canada, and government led health innovation initiatives.

Recommendation: Invest $9 million over three years to fund projects to implement clinical decision support tools for imaging referrals.

STAGNANT GROWTH TREND IN CT UNITS

CT Machines, total units and annual increase in units, 1990-2017 *Source: Conference Board, CADTH and CIHI*



3. TAKE A LEADERSHIP ROLE IN THE IMPLEMENTATION OF AI

Canada is well positioned to take a leading role to drive the integration of AI into healthcare, by capitalizing on its strengths in research, bioinformatics, and single-payer healthcare system. When polled, more than eight in ten Canadians said they would support additional research in the use of AI in radiology within Canada.[14]

The government has taken steps to drive the integration of AI into various technologies in Canada. Harnessing research for applications in medicine will define the way that the next generation of Canadians access and experience care. These applications will transform every aspect of patient care, improving medical decision-making in diagnostics, prognosis, selecting treatment methods and in providing robotic surgeries and examinations. In May 2018, the CAR published its first White Paper on Artificial Intelligence in Radiology, which provided a blueprint for the involvement of the CAR in research, development, and implementation of AI applications for imaging.[15] Subsequently in May 2019 a second white paper was released providing recommendations for establishing a legal and ethical framework for the implementation of AI in radiology.[16] This paper generated much interest from the medical community and from policy makers which resulted in the CAR being invited to present to the Standing Committee on Access to Information, Privacy and Ethics in June 2019.

In 2017 the government funded the Pan-Canadian Artificial Intelligence Strategy. Further, the Senate Committee on Social Affairs, Science and Technology's 2017 report *Challenge Ahead: Integrating Robotics, Artificial Intelligence and 3D Printing Technologies into Canada's Healthcare Systems* revealed that the federal government has a leadership role to play in encouraging provincial governments to integrate new technologies into the publicly funded systems. Catalyzing AI research that supports innovative approaches to address health system challenges will permit Canadian firms to flourish and contribute to economic growth.

To ensure that AI tools for medicine are developed and deployed quickly with patient safety and privacy in mind, the federal government must take lead on setting standards for the interoperability of AI systems, while addressing regulatory and legal issues that accompany the use of AI in medicine. Technology in imaging is moving so rapidly that industry is having to reapply for approval to Health Canada for the introduction of advancements of medical imaging equipment. This has become a burdensome process and causing Canada to be one of the last OECD countries to offer these innovations, which would improve quality of imaging as well as help to extend the reach of radiologists. With the integration of AI, radiologists can view more images and ultimately see more patients in a shorter time frame. This would promote a better work life balance and minimize burnout, which is a national issue that needs to be addressed.

The CAR is seeking collaboration with the government to help facilitate the appropriate development and implementation of AI tools to improve imaging care.

Recommendation: Invest $10.5 million over three years to begin establishing federal frameworks to regulate the implementation of AI tools in healthcare.

4. SAVING LIVES OF CANADIAN WOMEN

Breast cancer is the second leading cause of death from cancer in Canadian women. It is estimated that 20% of breast cancers in Canada are diagnosed in women under 50.[17] The Canadian Task Force on Preventive Health Care (Task Force) Breast Imaging Guidelines (released December 2018) recommend that only women 50 years and older be screened for breast cancer annually. By adhering to this criterion over 434 women will die unnecessarily each year.

Many patients with breast cancer, if detected early, can have high survival rates. In lowering the screening age to 40 years, we have a better chance of distinguishing these cancers and will be able to offer treatment options sooner.[18] The CAR in collaboration with the Canadian Society of Breast Imaging (CSBI) is opposed to the Task Force's guidelines and is advocating for the federal government to reject the guidelines and to review the structure of the Task Force to ensure that there is representation from the breast imaging radiology community on the board.

Recommendation: Revise the Canadian Task Force on Preventive Care Breast Imaging Guidelines to reflect current research, lowering the breast imaging screening age to 40 years.

The CAR would like to thank the Standing Committee on Finance for the opportunity to present our 2020 submission and would welcome the opportunity to elaborate further on the recommendations included.

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